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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/543,003	04/24/2006	Yuichi Ono	082368-004900US	7150

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EXAMINER	
LANDSMAN, ROBERT S	
ART UNIT	PAPER NUMBER
1647	

MAIL DATE	DELIVERY MODE
05/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/543,003	ONO ET AL.	
	Examiner	Art Unit	
	Robert Landsman, Ph.D.	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3 and 5-9* is/are pending in the application.

4a) Of the above claim(s) *3 and 5-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 July 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/22/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *Sequence Comparison*.

DETAILED ACTION

1. Formal Matters

A. The Response to the Lack of Unity filed 4/24/07 has been entered into the record.

B. Claims 1, 3 and 5-9 are pending. Applicants elected Group I, claims 1, 3 and 5 as drawn to SEQ ID NO:1 and 3. However, due to the identification of prior art, claims 3 and 5 will be restricted from claim 1. The response to the Traversal appears below. Claim 1 is the subject of this Office Action.

2. Rejoinder

A. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of MPEP § 821.04. **Process claims that depend from or otherwise include all the limitations of the patentable product** will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103, and 112. Until an elected product claim is found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowed product claim will not be rejoined. See "Guidance on Treatment of Product and Process Claims in light of *In re Ochiai, In re Brouwer* and 35 U.S.C. § 103(b)," 1184 O.G. 86 (March 26, 1996). Additionally, in order to retain the right to rejoinder in accordance with the above policy, Applicant is advised that the process claims should be amended during prosecution either to maintain dependency on the product claims or to otherwise include the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.**

Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

3. Traversal

A. Applicants argue that a special technical feature, the dopaminergic cell marker, exists among Groups I-IV. Regarding the traversal of SEQ ID NO:1 vs. 2 and 3 vs 4. Applicants have stated that these polynucleotides and polypeptides are 82-83% identical. These arguments have been considered, but is not deemed persuasive. First, as seen below, there is prior art under 35 USC 102 on the special technical feature (i.e. the marker). Furthermore, Applicants have not identified a common core structure between the proteins of SEQ ID NO:2 and 4, or the nucleic acids of SEQ ID NO:1 and 3. However, since SEQ ID NO:1 encodes SEQ ID NO:3, these two sequence will be searched. This Lack of Unity is deemed proper and is, therefore, made FINAL.

4. Specification

A. The specification is objected to due to the use of hyperlinks, for example, on page 25, lines 1 and 5. Applicant is advised that embedded hyperlinks and/or other forms of browser-executable code are impermissible and require deletion. The attempt to incorporate subject matter into the patent application by reference to a hyperlink and/or other forms of browser-executable code is considered to be an improper incorporation by reference. See MPEP 608.01(p), paragraph I regarding incorporation by reference.

B. The specification is objected to since the Brief Description of Figure 7 should begin with, e.g, "Fig. 7A-D are..."

C. According to 37 CFR 1.821(d) (MPEP § 2422), where the description or claims of a patent application discuss a sequence listing that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the assigned identifier, in the text of the description or claims, even if the sequence is also embedded in the text of the description or claims of the patent application. Sequences appear on page 33 lines 1-3 of the specification but are not identified by SEQ ID NO as required.

5. Claim Objections

A. Claim 1 is objected to for reciting non-elected subject matter (SEQ ID NO:2 and 4).

B. No objection is being made to claim 1 regarding the phrase "a nucleotide sequence." However, it is brought to Applicants' attention that the use of the word "a" can be interpreted, for prior art purposes, as meaning a single nucleotide or amino acid – as opposed to "the nucleotide sequence" which is interpreted as the entire sequence.

6. Claim Rejections - 35 USC § 112, first paragraph – scope of enablement

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

A. Claims 1 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the marker of SEQ ID NO:1, does not reasonably provide enablement for markers which are polynucleotides which are fragments of, or which hybridize to, SEQ ID NO:1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

In In re Wands, 8USPQ2d, 1400 (CAFC 1988) page 1404, the factors to be considered in determining whether a disclosure would require undue experimentation include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

First, the breadth of the claim is excessive with regard to claiming all polynucleotide markers which "**hybridize**" under stringent conditions to that of SEQ ID NO:1, or which are "**fragments**" of SEQ ID NO:1. Nucleic acid molecules which "hybridize" to SEQ ID NO:1 would have one or more nucleic acid substitutions, deletions, insertions and/or additions to said polynucleotides.

Applicants provide no guidance or working examples of nucleic acid molecules which hybridize to SEQ ID NO:1, or which fragments of SEQ ID NO:1 can be used as markers, nor is it predictable to one of ordinary skill in the art what polynucleotides which hybridize to SEQ ID NO:1 could be used as markers for the claimed cells. Furthermore, the polynucleotide of SEQ ID NO:1 is over 4000 bases. It is not known which fragments of comprising only 15 bases could be used to identify the claimed cell. Similarly, since the claim recites "a nucleotide sequence," which reads on a single base, it is not known how a single base could be used to identify a cell.

For these reasons, the Examiner to hold that undue experimentation is necessary to practice the invention as claimed.

7. Claim Rejections - 35 USC § 112, first paragraph – written description

A. Claim 1is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This is a genus claim. Nucleic acid molecules which "**hybridize**" to SEQ ID NO:1 would have one or more nucleic acid substitutions, deletions, insertions and/or additions to said sequence. Similarly, fragments comprising 15 bases of SEQ ID NO:1 would have one or more bases deleted. SEQ ID NO:1 is over 4000 bases and Applicants have not described which of the large number of probes could be used as a marker for the claimed cell, especially in light of the fact that "**fragments**" as small as 15 bases, or even as small as one base, can be used to specifically identify the claimed cell from other known cell types. Since the claim recites "a nucleotide sequence" a single base reads on the claim. Again, Applicants have not provided sufficient guidance as to how a single base can identify the claimed cell type.

The specification and claims do not indicate what distinguishing attributes are shared by the members of the genus. Thus the scope of the claims includes numerous structural variants, and the genus is highly variant because a significant number of structural differences between genus members is permitted. The specification and claims do not provide any guidance as to what changes should be made. Structural features that could distinguish compounds in the genus from others in the nucleic acid or protein class are missing from the disclosure. No common structural attributes identify the members of the genus. The general knowledge and level of skill in the art do not supplement the omitted description because specific, not general, guidance is what is needed. Since the disclosure fails to describe the common attributes or characteristics that identify members of the genus, and because the genus is highly variant, SEQ ID NO:2, 5 and 32, or molecules which hybridize to the polynucleotides encoding these SEQ ID NOs (which could be at least thousands of molecules) alone are insufficient to describe the genus. One of skill in the art would reasonable conclude that the disclosure fails to provide a representative number of species to describe the genus. Thus, Applicant was not in possession of the claimed genus at the time the invention was made.

8. Claim Rejections - 35 USC § 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

A. Claim 1 is vague and indefinite since claim 1 recites "stringent conditions." It is not known what these conditions are. Nucleic acid molecules which hybridize under conditions of "low" stringency would not necessarily hybridize under conditions of "high" stringency. Furthermore, not all conditions of "high" or "low" stringency, for example, are the same. Therefore, it is required that Applicants amend the claims to recite the exact hybridization conditions without using indefinite phrases such as "*for example*" **without adding new matter**.

9. Claim Rejections - 35 USC § 102

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by ***. Claims 13-16 of US20060239978.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

B. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Tomita. The claim recites a marker complementary to SEQ ID NO:1, which hybridizes to SEQ ID NO:1, or which is a fragment of SEQ ID NO:1 as small as 1 base. Tomita teach a polynucleotide 100% identical to SEQ ID NO:1 (Sequence Comparison A). Both are identified as Lrp4 proteins. Therefore, even if Tomita did not disclose the fact that their sequence could be used as a marker, it would be inherent that this polynucleotide, which is 100% identical to that of the claimed invention, could be used as a marker.

10. Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

A. Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 13-16 of copending Application No. US20060239978. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application recite a probe comprising at least 15 bases, or which hybridizes to SEQ ID NO:1. The application also claims methods of using the probe and the cell identified by the probe. The '978 application recites using a large fragment of SEQ ID NO:1 as well as the same methods of using.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. Conclusion

A. No claim is allowable.

Advisory information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Landsman whose telephone number is (571) 272-0888. The examiner can normally be reached on M-Th 10 AM – 7 PM (eastern).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brenda Brumback can be reached on 571-272-0961. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert Landsman, Ph.D.
Primary Examiner
Art Unit 1647

Sequence Comparison

AB013874

LOCUS AB013874 4864 bp mRNA linear ROD 11-NOV-1998
DEFINITION Mus musculus mRNA for Low Density Lipoprotein Receptor Related Protein 4, complete cds.
ACCESSION AB013874
VERSION AB013874.1 GI:3869144
KEYWORDS Low Density Lipoprotein Receptor Related Protein 4.
SOURCE Mus musculus (house mouse)
ORGANISM Mus musculus
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Sciurognathi; Muroidea; Muridae; Murinae; Mus.
REFERENCE 1
AUTHORS Tomita,Y., Kim,D.H., Magoori,K., Fujino,T. and Yamamoto,T.T.
TITLE A novel low-density lipoprotein receptor-related protein with type II membrane protein-like structure is abundant in heart
JOURNAL J. Biochem. 124 (4), 784-789 (1998)
PUBMED 9756624
REFERENCE 2 (bases 1 to 4864)
AUTHORS Kim,D., Tomita,Y. and Yamamoto,T.T.
TITLE Direct Submission
JOURNAL Submitted (12-MAY-1998) Dongho Kim, Tohoku University, Gene Research Center; 1-1 Tsutsumidori Amamiya Aoba, Sendai, Miyagi 981-8555, Japan (E-mail:dondon@biochem.tohoku.ac.jp, Tel:81-22-717-8875, Fax:81-22-717-8877)
FEATURES Location/Qualifiers
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polyA_site 4864
/note="16 a nucleotides"
ORIGIN

Alignment Scores:

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Score:	6237.00	Matches:	1113

Percent Similarity:	100.0%	Conservative:	0
Best Local Similarity:	100.0%	Mismatches:	0
Query Match:	100.0%	Indels:	0
DB:	6	Gaps:	0

US-10-543-003-3 (1-1113) x AB013874 (1-4864)

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Db        961 TGGCCGGATTCCCTCAGATGCTCTCAGTTTAGGGACCACACTGAGACTAACAGCAGTGTC 1020

Qy        321 ArgLysSerCysPheSerLeuGlnGlnGluHisGlyLysGlnSerLeuCysGlyGlyGly 340
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1021 AGAAAGAGCTGCTTCTCACTGCAGCAGGAACATGGAAAGCAATCACTCTGTGGAGGGGGC 1080

Qy        341 GluSerPheLeuCysThrSerGlyLeuCysValProLysLysLeuGlnCysAsnGlyTyr 360
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1081 GAGAGCTTCCTGTGTACCAGCGGGCTCTGCGTCCCCAAGAAGCTGCAGTGTAACGGCTAT 1140

Qy        361 AsnAspCysAspAspTrpSerAspGluAlaHisCysAsnCysSerLysAspLeuPheHis 380
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1141 AATGACTGTGATGACTGGAGCGACGAGGCGCATTGCAACTGCAGCAAGGATCTGTTTCAC 1200

Qy        381 CysGlyThrGlyLysCysLeuHisTyrSerLeuLeuCysAspGlyTyrAspAspCysGly 400
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1201 TGTGGCACAGGCAAGTGCCTCCACTACAGCCTCTTGTGTGATGGGTACGATGACTGTGGG 1260

Qy        401 AspProSerAspGluGlnAsnCysAspCysAsnLeuThrLysGluHisArgCysGlyAsp 420
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1261 GACCCGAGTGACGAGCAAAACTGTGATTGTAATCTCACAAAAGAGCATCGCTGTGGAGAT 1320

Qy        421 GlyArgCysIleAlaAlaGluTrpValCysAspGlyAspHisAspCysValAspLysSer 440
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1321 GGGCGCTGCATTGCGGCTGAGTGGGTGTGCGATGGGGACCATGACTGTGTGGACAAGTCT 1380

Qy        441 AspGluValAsnCysSerCysHisSerGlnGlyLeuValGluCysThrSerGlyGlnCys 460
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1381 GATGAGGTCAACTGCTCTTGTCACAGCCAGGGCCTGGTGGAATGCACAAGTGGACAGTGC 1440

Qy        461 IleProSerThrPheGlnCysAspGlyAspGluAspCysLysAspGlySerAspGluGlu 480
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1441 ATCCCTAGCACCTTCCAGTGTGATGGGGACGAAGACTGTAAGGATGGGAGTGACGAGGAG 1500

Qy        481 AsnCysSerAspSerGlnThrProCysProGluGlyGluGlnGlyCysPheGlySerSer 500
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1501 AACTGCAGTGACAGTCAGACGCCATGTCCAGAAGGAGAACAGGGATGCTTTGGCAGTTCC 1560

Qy        501 CysValGluSerCysAlaGlySerSerLeuCysAspSerAspSerSerLeuSerAsnCys 520
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1561 TGCGTCGAATCCTGTGCTGGTAGCTCTCTGTGTGACTCAGACAGCAGCCTGAGTAACTGC 1620

Qy        521 SerGlnCysGluProIleThrLeuGluLeuCysMetAsnLeuLeuTyrAsnHisThrHis 540
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1621 AGTCAATGTGAGCCCATCACTTTGGAACTCTGCATGAATTTGCTCTACAACCATACACAT 1680

Qy        541 TyrProAsnTyrLeuGlyHisArgThrGlnLysGluAlaSerIleSerTrpGluSerSer 560
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1681 TATCCAAATTACCTTGGCCACAGAACTCAAAAGGAAGCGTCCATCAGCTGGGAGTCATCC 1740

Qy        561 LeuProAlaLeuValGlnThrAsnCysTyrLysTyrLeuMetPhePheAlaCysThr 580
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1741 CTTTTCCCTGCCCTTGTACAAACCAACTGTTACAAATACCTCATGTTTTTCGCTTGCACC 1800

Qy        581 IleLeuValProLysCysAspValAsnThrGlyGlnArgIleProProCysArgLeuLeu 600
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1801 ATTTTGGTTCCAAAGTGTGATGTGAATACAGGACAACGCATCCCGCCTTGCAGACTCCTG 1860
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Qy        601 CysGluHisSerLysGluArgCysGluSerValLeuGlyIleValGlyLeuGlnTrpPro 620
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1861 TGTGAGCACTCCAAAGAGCGCTGTGAGTCTGTTCTGGGAATCGTTGGCCTGCAGTGGCCT 1920

Qy        621 GluAspThrAspCysAsnGlnPheProGluGluSerSerAspAsnGlnThrCysLeuLeu 640
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1921 GAAGACACCGACTGCAATCAATTTCCAGAGGAAAGTTCAGACAATCAAACTTGCCTCCTG 1980

Qy        641 ProAsnGluAspValGluGluCysSerProSerHisPheLysCysArgSerGlyArgCys 660
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       1981 CCCAATGAAGATGTGGAAGAATGCTCTCCGAGTCACTTCAAATGCCGCTCGGGACGATGC 2040

Qy        661 ValLeuGlySerArgArgCysAspGlyGlnAlaAspCysAspAspAspSerAspGluGlu 680
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2041 GTTCTGGGCTCCAGGAGATGTGACGGCCAGGCTGACTGTGACGACGACAGTGACGAGGAG 2100

Qy        681 AsnCysGlyCysLysGluArgAlaLeuTrpGluCysProPheAsnLysGlnCysLeuLys 700
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2101 AACTGTGGTTGTAAAGAGAGAGCTCTTTGGGAATGTCCATTTAATAAGCAATGTCTGAAG 2160

Qy        701 HisThrLeuIleCysAspGlyPheProAspCysProAspSerMetAspGluLysAsnCys 720
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2161 CATACATTAATCTGCGATGGGTTTCCAGATTGTCCAGACAGTATGGATGAAAAAAACTGC 2220

Qy        721 SerPheCysGlnAspAsnGluLeuGluCysAlaAsnHisGluCysValProArgAspLeu 740
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2221 TCATTTTGCCAAGACAATGAGCTGGAATGTGCCAACCATGAGTGTGTGCCGCGTGACCTT 2280

Qy        741 TrpCysAspGlyTrpValAspCysSerAspSerSerAspGluTrpGlyCysValThrLeu 760
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2281 TGGTGCGACGGATGGGTCGACTGCTCAGACAGTTCTGATGAATGGGGCTGTGTGACCCTC 2340

Qy        761 SerLysAsnGlyAsnSerSerSerLeuLeuThrValHisLysSerAlaLysGluHisHis 780
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2341 TCTAAAAATGGGAACTCCTCCTCATTGCTGACTGTTCACAAATCTGCAAAGGAACACCAC 2400

Qy        781 ValCysAlaAspGlyTrpArgGluThrLeuSerGlnLeuAlaCysLysGlnMetGlyLeu 800
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2401 GTGTGTGCTGACGGCTGGCGGGAGACGTTGAGTCAGCTGGCCTGCAAGCAGATGGGTTTA 2460

Qy        801 GlyGluProSerValThrLysLeuIleProGlyGlnGluGlyGlnGlnTrpLeuArgLeu 820
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2461 GGAGAACCGTCTGTGACCAAGCTGATCCCAGGACAGGAAGGCCAGCAGTGGCTGAGGTTG 2520

Qy        821 TyrProAsnTrpGluAsnLeuAsnGlySerThrLeuGlnGluLeuLeuValTyrArgHis 840
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2521 TACCCCAACTGGGAGAATCTCAATGGGAGCACCTTGCAGGAGCTGCTGGTATACAGGCAC 2580

Qy        841 SerCysProSerArgSerGluIleSerLeuLeuCysSerLysGlnAspCysGlyArgArg 860
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2581 TCCTGCCCAAGCAGAAGTGAGATTTCCCTTCTGTGCTCCAAGCAAGACTGTGGCCGCCGC 2640

Qy        861 ProAlaAlaArgMetAsnLysArgIleLeuGlyGlyArgThrSerArgProGlyArgTrp 880
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2641 CCTGCTGCCCGAATGAACAAGAGGATCCTTGGGGGTCGGACTAGTCGTCCTGGGAGGTGG 2700

Qy        881 ProTrpGlnCysSerLeuGlnSerGluProSerGlyHisIleCysGlyCysValLeuIle 900
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2701 CCGTGGCAGTGCTCTCTGCAGAGTGAACCCAGTGGACATATCTGTGGCTGTGTCCTCATT 2760

Qy        901 AlaLysLysTrpValLeuThrValAlaHisCysPheGluGlyArgGluAspAlaAspVal 920
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2761 GCCAAGAAGTGGGTCCTGACAGTTGCCCATTGCTTTGAAGGGAGAGAAGACGCTGATGTT 2820
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Qy        921 TrpLysValValPheGlyIleAsnAsnLeuAspHisProSerGlyPheMetGlnThrArg 940
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2821 TGGAAAGTGGTATTTGGCATAAACAACCTGGACCATCCATCAGGCTTCATGCAGACCCGC 2880

Qy        941 PheValLysThrIleLeuLeuHisProArgTyrSerArgAlaValValAspTyrAspIle 960
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2881 TTTGTGAAGACCATCCTGCTACATCCCCGTTACAGTCGAGCAGTGGTAGACTATGATATC 2940

Qy        961 SerValValGluLeuSerAspAspIleAsnGluThrSerTyrValArgProValCysLeu 980
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       2941 AGCGTGGTGGAGCTGAGCGATGATATCAATGAGACAAGCTACGTCAGACCTGTCTGCCTA 3000

Qy        981 ProSerProGluGluTyrLeuGluProAspThrTyrCysTyrIleThrGlyTrpGlyHis 1000
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       3001 CCCAGTCCGGAGGAGTATCTAGAACCAGATACGTACTGCTACATCACAGGCTGGGGCCAC 3060

Qy       1001 MetGlyAsnLysMetProPheLysLeuGlnGluGlyGluValArgIleIleProLeuGlu 1020
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       3061 ATGGGCAATAAAATGCCCTTTAAGCTGCAGGAGGGAGAGGTCCGCATTATCCCTCTGGAG 3120

Qy       1021 GlnCysGlnSerTyrPheAspMetLysThrIleThrAsnArgMetIleCysAlaGlyTyr 1040
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       3121 CAGTGCCAGTCCTATTTTGACATGAAGACCATCACCAATCGGATGATCTGTGCTGGCTAT 3180

Qy       1041 GluSerGlyThrValAspSerCysMetGlyAspSerGlyGlyProLeuValCysGluArg 1060
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       3181 GAGTCTGGCACCGTGGACTCCTGCATGGGAGACAGCGGTGGGCCTCTGGTTTGTGAACGA 3240

Qy       1061 ProGlyGlyGlnTrpThrLeuPheGlyLeuThrSerTrpGlySerValCysPheSerLys 1080
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       3241 CCCGGAGGACAGTGGACATTATTTGGTTTAACTTCATGGGGCTCCGTCTGCTTTTCCAAA 3300

Qy       1081 ValLeuGlyProGlyValTyrSerAsnValSerTyrPheValGlyTrpIleGluArgGln 1100
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db       3301 GTTCTGGGACCTGGAGTGTACAGCAATGTGTCTTACTTTGTGGGCTGGATTGAAAGACAA 3360

Qy       1101 IleTyrIleGlnThrPheLeuGlnLysLysSerGlnGly 1113
              |||||||||||||||||||||||||||||||||||||||
Db       3361 ATATATATCCAGACCTTTCTCCAAAAGAAATCCCAAGGA 3399
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